Philosophical Hermeneutics and the Promotion of Reflective Writing in Educational Software

Qualifying Paper

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1. Plan of the work

Where the purpose and an outline of hermeneutic components of the study are introduced.

It is well to begin with a fundamental definition of the paper's most central term. Hermeneutics is a branch of philosophy stressing text interpretation, reflective writing, and the evolution of subjective viewpoints over time (Crusius, 1991). Hermeneutic pedagogies foster reflection through the technique of inner (and social) dialogue (Misgeld & Jardine, 1989). In hermeneutics, occasions of dialogue possess interrelated features. For instance, the individual ability to create perspective through subsequent interpretations of events is explained by the hermeneutic principle of distanciation (Habermas, 1971): a "polarity of familiarity and strangeness" (Gadamer, 1960, p. 295) that emerges with the perception of an event as initially unfamiliar, but which gradually becomes more familiar as surrounding expertise and context are acquired. Features and pedagogical imperatives of writing-based software overlook the need to enhance the writer's sensitivity to distanciation. Another hermeneutic dimension important to hermeneutic dialogue but missing in educational writing software listed above is prejudice in language: to hermeneutics, true dialogue reveals forestructures of understanding: the implicit prejudices one brings to situations (Heidegger, 1962, p. 150).

This work is structured as an inquiry and potential design intervention. It examines a historical set of weaknesses in approach, profundity, and organization that characterize writing instruction. In brief, this problem is a lack of balance in the understanding of what is important for writers to learn, with the bulk of pedagogic emphasis falling on the mechanics of style that justifies the view that there is something like "proper writing." If we were interested only in verb/voice conjugation or other lexical mechanics of the writer's skill set, it would not be possible either to critique the current state of affairs or to propose something new. Certainly, such mechanics are appropriate goals *for a certain kind of learner and up to a point*. An audience well-served by grammatical and compositional focus, for instance, could include writers up to a middle school level. But at some point, what motivates accuracy in language must give way to what motivates legitimation in voice, and so the adult and college writer must transcend grammatical proficiency and develop adeptness with more introspective forms of self-analysis and expression. The latter interest, epitomized in reflective writing, is the trajectory of the current work.

How can the understanding that gives way to profound voice, to reflective writing, be evoked? An outline of the hermeneutic components through which this study proceeds will show that *understanding* in the hermeneutic tradition (in fact there are *various* hermeneutic traditions, but we shall overlook this for now) is an evolving, unrestrained process, rather than a modeled, (formal

or otherwise) hierarchically contained concept. The aim of the current study is thus to select criteria from hermeneutics that can inform the design of reflective writing software - the design of software is justified as a dialogical environment that enables the writer to develop the variety of perspectives that reflective writing requires. I therefore posit a speculative intersection between the conceptual character of writing, the visual character of a software interface, and the historical character of hermeneutics.

For its part, the centuries-old hermeneutics literature is extensive, and there have, in this century, been many interesting developments, especially in those areas of it that share a boundary with critical theory. The best approach in the scope and size of this work is to select works that are hermeneutic in character, but whose approach lends them to an extraction of their salient components for possible application in the practice of reflective writing. Since there is no pilot study associated with the current investigation, such practice is limited to the speculative potential it may realize within an interactive software environment as emerges from the case study of a famous hermeneutically-centered literary analysis. The scope limitation of the paper also means that I must omit certain key hermeneutic concepts as too abstract to be realized in a software environment. One must be practical - which means working with the possible. But one must also be speculative - which means pushing the possible gently outward. Regarding a balance of the possible within the speculative, the paper is guided by four increasingly detailed questions:

1. Definition - What is reflective writing? The goal of reflective writing is to enable the writer to attain some self-understanding by exploring personal attitudes, experiences, and memories. But criteria for identifying any writing as reflective are less clear. This vagueness may account for the lack of reflective writing support in educational software.
2. Pedagogy - How has writing been taught? As mentioned, there is no universal consensus on how to foster reflection in writing. But criteria for following and fostering intuitions, and activities for learning to illustrate them, potentially represent as momentous a contribution of hermeneutics to educational software design, as it has to educational curriculum design. An examination of the recent (1900-1995) pedagogical history of writing instruction confirms the relationship between epistemological eras and the direct projection of their imperatives and assumptions onto evolving conceptions of "proper" writing.
3. Historicity - What hermeneutic methods exist for multiple perspectives to emerge and remain available to memory?
4. The reflective writer must understand shifts in perception over time, and when such perceptions are written, they form part of a corpus for recollection. But exactly how viewpoints, arguments, and descriptions are brought into relevant play with current observations calls for more subtle treatment. Historicity and recollection comprise hermeneutic practices for how evolving texts are created (e.g., journal-writing), and these perspective-taking methods sharpen the writer's descriptive competence. So as not to remain exclusively in categorical

abstractions, I will use the clearest example of a hermeneutically dissected text that I know, Roland Barthes' S/Z which is the analysis of a short novel by Honore Balzac. The novel is scarcely 90 pages long; Barthes' analysis (which has since become much more famous than the novel itself), goes to almost 260 pages. By using a work which is an annotated hermeneutic analysis of another, the intended deductions of my approach form a normative arc that culminates in speculations on how reflective writing can be facilitated if hermeneutic techniques are implemented in software:

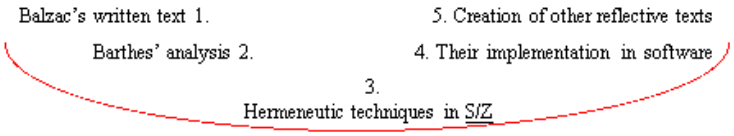

Figure 1. Hermeneutic arc of reflection motivating this study.

The historical dimension of the work relates to the way in which what has been created in the past remains open to reuse, reinterpretation in a written work. More accurately, the techniques on which I will focus are meaning-preserving and meaning-enhancing; that is, techniques by which the author immerses the reader into deeper connotations and implications of what is written. My operational heuristic is straightforward: if the reader can become reflective, it is because the writing was itself reflective.

1. Transcendence - What hermeneutic methods exist by which the writer's subjective perspective is made explicit, questioned, understood, and eventually transformed? A fundamental hermeneutic principle is that texts and experiences reveal themselves in *aspects*; so that understanding is never perceived whole, but only as a succession of incomplete views (Ingarden, 1973). But how these successive revelations come to reveal and transform the one-sidedness of a writer requires more precise clarification from methods in the literature.

Question 1 and 2 receive their own section ("Section 2. Definition - What is Reflective Writing?" and "Section 3. Pedagogy - How Has Writing Been Taught?"). Questions 3 and 4 are inseparable in any meaningful sense, and are treated in overlapping manner within a single section ("Section 4. Praxis - How is Hermeneutic Software Possible?").

I suggest that the investigation of hermeneutics as applied to electronic writing may point to a new pedagogy of writing, and a new approach to pedagogical design of educational writing software. The paper should help software designers understand central problems, possibilities, techniques, and methods of reflective writing from a hermeneutic viewpoint, where reflection in the writing process can be implemented in educational software. As I will show, the educational problems of reflective writing have not been addressed by the important genre of educational software.

2. Definition - What is Reflective Writing?

Where a fundamental definition and comparison of operational terms is first established.

As reflective writing depends upon hermeneutic principles, let us define the latter discipline first. Hermeneutics is the study of the historical, the reflective, and the written in convergence, and we begin with a working definition of hermeneutical reflection. The first rendering of this term comes from Wilhelm Dilthey, one of the first modern hermeneuticists. In an intricate and highly involved definition, Dilthey calls reflection that which happens around events in life that cannot be assigned a definite historical meaning (Makkreel, 1975, pp. 376-377); reflection is to him that activity associated with an event that is not seen as entirely separate from us or from our experience. It is perpetually redefining itself, perpetually subjective, and never an object bearing a name, a label, or a boundary. Although it churns from experience and memory, reflection itself is never the product of something prior, but is instead a human drive, a motivating process. It is the combination of a mode of reconciliation of past experience with a search for new possibilities. But reflection desires to lead to something known or acknowledged, and the struggle of subjective experience with conscious awareness in order to produce a projective *object* is also a hermeneutic imperative. This was the subsequent interest of Hans-Georg Gadamer, whose essay "On the scope and function of hermeneutical reflection" provides the basis for such a definition:

Hermeneutical reflection fulfills the function that is accomplished in all bringing of something to a conscious awareness...Reflection on a given preunderstanding brings before me something that otherwise happens *behind my back*... Certainly I do not mean that such reflection could escape from ideological ossification if it does not engage in constant self-reflection and attempts at self-awareness. Thus only through hermeneutical reflection am I no longer unfree over against myself but rather can deem freely what in my preunderstanding may be justified and what unjustifiable. (Gadamer, 1967, p. 38)

It is equally clear that no definition of reflection, especially vis-à-vis historical understanding (understanding that evolves in parts, rather than as a whole) is complete.

The question of memory as the basis for hermeneutic reflection is solved by the act of writing (inadequate though writing may be, in comparison to oral communication). Memory is the sole possession of those who have experience of the act; a visitor can have a *retelling* of past events, but not a memory of them. Thus, memory begins prior to hermeneutic treatment as something monadic: elemental, but unconnected. As hermeneutics is concerned with techniques for synthesizing a memory of events as executed by those absent from the original act, and where

language is the only trace of the intent, we see early efforts to make memory a stable and generative component of hermeneutic understanding. Dilthey, for instance, builds an influential poetics that combines memory with imagination , and later (and most importantly) with his central concept of *Erlebnis*, lived or reflective experience (for a treatment of this synergy, see Makkreel, 1975, pp. 358-364). Dilthey's use of memory in lived experience illustrates that hermeneutics is not exclusively the study of memory, of recalling the act in its time, but of the broader problems of contemporary reconstruction of that past is ours, and the reflective activities (like poetics) that obtain therefrom. This fact leads to the second aspect of hermeneutic reflection.

The problem of interpretation is the second aspect of hermeneutic reflection. Interpretation initially appears as the process that follows the recollection of past experience, with an aim to reconstruct what was intended. It is true that interpretation is always historical, because it relies on what has "already happened" in order to come in contact with the intention of an act. But the misbegotten notion that one can, with minimal information, reconstruct the totality of past intentions and acts, is one of the barriers to cultural understanding and human empathy. For without such context, one is tempted to perceive another only as a member of one's own historical formation. It is for this reason that interpretation is more than what follows recollection. To Gadamer,

"[i]nterpretation is not an occasional, post facto supplement to understanding; rather, understanding is always interpretation, and hence interpretation is the explicit form of understanding. In accordance with this insight, interpretive language and concepts were recognized as belonging to the inner structure of understanding. This moves the whole problem of language from its peripheral and incidental position into the center of philosophy." (Gadamer, 1996 [1960], p. 307).

Gadamer's equation of interpretation and understanding (*and* to language, without implying that they must only be approached in the reductionistic terms of analytical philosophy) is why I consider the present study to be important in terms that must both include and transcend purely scholarly interests of philosophy, composition study or software design. As the topic is reflective writing, the target here is the set of horizons and responsibilities of the writer. What is at stake in any writing begins with the possibility of unifying with conditions endemic to what is being described, and ends in understanding the elusive complexity of knowing one's own self as that which is looking *at* the object under description. One is reminded of the words of St. Francis of Assisi, who stated that what we are looking for is what is doing the looking. This statement is the height of reflective writing, and in the following pages, we shall have to settle for many weaker versions of it as normative goals for the reflective writer, but the goal is still worthwhile.

With the previous statements, I coarsely differentiate the expository writer from the reflective writer (I do not use "creative writer" because this suggests a focus on fictive genres and themes, whereas a writer can also be creative in expository or non-fiction practices). The expository writer describes external phenomena and actions; the reflective writer also encompasses these expository goals, but moves from these to an attempt at understanding internal perception and self as facets of the overall description. Thus every description bears its potential as an exercise in self-understanding, which leads to key questions in the present work, how can the writing environment elicit reflective impulses from the writer? How can the writer come to understand description as a

totality of observing phenomena *and* observing the observations? How can the writer come to understand how description is *in* the phenomena and how the writer is *in* the description? This last question argues that there are aspects of what is described that appear in the description as much as there are aspects of the description that are also in the writer. This latter type of description is not a traditional goal of composition studies. The latter have focused (as I will show in subsequent pages) on methods for generating ideas and concepts as part of getting a "properly executed and planned" description in writing. In this cognitive view, then, writing boils down to problem solving. As this orientation is anti-hermeneutic, an initial differentiation between it and hermeneutic approaches should be made.

2.1. Clarification: Reflective Writing versus Cognitive Writing

Where methodological differences are shown by means of analysis of a renowned cognitive study.

The central distinction to be shown in this section is that reflective writing is not cognitive writing. The latter is a group of practices under which the author develops a theme in a logical, layered manner, and throughout remains focused on the clarity and quality of the writing. Cognitive (or process) writing is therefore concerned to be content-neutral: as long as the techniques are followed, the result is readable and consistent (Zvacek, 1988). Reflective writing, however, is normative; its agenda is the unification of the writer's and reader's identities with the matter under observation by focusing on the fullest meaning in a text. Though its intentions may be hidden, a text often symbolizes layers of its origins that connect with those of the writer and the reader. It is difficult to create a fully autonomous text that bears no reflection to the writer. In hermeneutics, intention is equated with being, since sacred texts were examined for the trace of transcendental will presumably conveyed by them. As the writer was frequently a saint, a divinely inspired rabbi, or a person touched by the gift of higher consciousness, writings were a reflection of his state of being, and also that of the Master Hand that guided the text. Thus, a reflective perspective has remained in hermeneutic inquiry, and today, this is the best, and perhaps the only, way to truly implicate the writer in the text, as opposed to encouraging the creation of reports or other written genres whose statements are presumably neutral and independent of the observer. When added to the notion that style, voice, and form in writing emerge from a tradition in which the writer is embedded, hermeneutically reflective writing implies that *all* observation involves self-observation. What symbolizes writer cannot leave the text.

In diametric opposition to reflective writing, cognitive writing poses the view that the writer must *never* enter the text (doing so would taint it with subjectivity). Cognitive writing sees writing as a scientific device. This relates to a contrast where the world is describable either in whole or only in part. In literary theory, these distinctions exist with categories of world, describable by different methods and genres. Weinrich (1964) discerns between the *besprochene Welt* - the commented world available to essays and poetic constructions - and the *erzählte Welt* - the narrated world in which the addresser and addressee are not linked in a single context, an encompassing whole of action and consequence; a world of memoranda, and reports.

Analogously, Benveniste (1971) also posits the distinction between *discours* (discourse) and *histoire* (story) as entire linguistic subsystems, not just devices. Here discourse expresses a telling that unifies in the same person the teller and experiencer of the act. When the teller is different

from any person in the tale, there is a narrative separation. This separation is overcome by a first-person experience, also known as enunciation (Greimas & Courtés, 1976). Accounts with an enunciator have an immediate impact that narrated accounts lack, for which reason the latter are seen as the different descriptive genus of story rather than discourse.

Having noted the contrast between participation among writer, world, and text (the reflective imperative) versus distance between same (the cognitive orientation), we can move to show how this difference manifests in the pedagogy and analysis of the cognitive writing paradigm.

The foremost example of a cognitive writing approach involves protocol analysis, first set out by Hayes and Flower (1979). Protocol analysis (PA) is an attempt at a systematic method for observing the tasks undertaken by writers in the composition and logical organization of their texts. The approach divides the production system into a task environment, which includes the writing assignment and the text produced so far; the writer's long term memory, which includes the writer's topical knowledge and ideas as to how to develop or expose the topic; and the writing process itself, which includes the activities of planning, organizing, and reviewing material. PA includes a list of goals that become generated as the writing proceeds. This goal-ordering task is the job of a conceptual *monitor* within the writing process sector of the model. Each large-scale goal (known as a configuration) is comprised of a set of conditions that the writer could find at a given moment (e.g., not having enough material), and for each such case, a goal is given as a specific corrective. This conceptual monitor organizes the configurations (the writing objectives) in a production-rule-like manner:

Table 1.

Hayes & Flower - Conceptual Monitor

```
Configuration 1 (Depth first)
3. [ New element from translate    ----> (goal = review)]
4. [ New element from organize     ----> (goal = translate)]
5. [ New element from generate     ----> (goal = organize)]
6. [ Not enough material           ----> (goal = generate)]

Configuration 2 (Get it down as you think of it, then review)
3. [ New element from generate     ----> (goal = organize)]
4. [ New element from organize     ----> (goal = translate)]
5. [ Not enough material           ----> (goal = generate)]
6. [ Enough material               ----> (goal = review)]

Configuration 3 (Perfect first draft)
3. [ Not enough material           ----> (goal = generate)]
4. [ Enough material,
       plan not complete           ----> (goal = organize)]
5. [ New element from translate    ----> (goal = review)]
6. [ Plan complete                 ----> (goal = translate)]

Configuration 4 (Breadth first)
3. [ Not enough material           ----> (goal = generate)]
4. [ Enough material,
       plan not complete           ----> (goal = organize)]
5. [ Plan complete                 ----> (goal = translate)]
6. [ Translation complete          ----> (goal = review)]
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Note. From Flower, L. S. & Hayes, J. R. (1979) A process model of composition. Technical Report No. 1, Document Design Project. Pittsburgh, PA: Carnegie Mellon University, p. 33.

This diagram (as others) of the Hayes & Flower model is set up like a flow mechanism wherein one weakness (e.g., not enough material) becomes compensated by a contrasting action (e.g., goal = generate). It can be seen that the process model is arranged around 4 basic writing activities of generating, organizing, translating, and editing. These activities were culled from the recorded analysis of student writers discussing their aesthetics and approach to writing. This appears to be an objective procedure of analysis until we read the transcripts containing the students' words. For,

in this case, when students are asked in an academic environment to discuss what constitutes good writing, they will naturally conflate good with what satisfies assignments given, because, while that is not the nature of writing, it is the nature of the academic performance contract into which they have entered for the long term. One personal, instinctive goal (to satisfy subjective criteria) is preempted by a larger, cultural one (to satisfy assessment criteria).

A simple case of this displacement is the transcript (a.k.a. protocol) of "Wendy," a college student who talks about her writing early on in Hayes & Flowers' study. The transcript consists of 29 lines of verbatim commentary. On line 1 she is identified and the date of the session is given. Wendy speaks from lines 2 to 9 (and later again) beginning with (emphases mine):

OK, um, the issue is motivation and the problem of writing papers. For me, motivation here at Carnegie-Mellon is the academic pressure and grades that are involved, so I'd better put that down... and grades... Um, they kind of compel me, that's really what motivates me is, um, kind of to impel or start or a, momentum. (Pause.) OK, I from the academic pressure of the grades, I'm not sure whether - I think personal satisfaction is important, but I'm not sure what stems from academic pressures and grades, or whether - I would say personal satisfaction is a major issue. (Hayes & Flower, 1979, p. 64)

The writer's roundabout hesitation notwithstanding, she is nevertheless explaining in elementary terms that her writing is conditioned by the continual exigencies of academic assessment. The important part of a transcript such as this is the way in which it is used to accommodate or support the writing theory. Hayes and Flower interpret the writer's angst in terms that coerce it strictly within the bounds of their model: as a data organization problem. Wendy's transcript is introduced in the following way (again, emphases mine):

In the protocol in Figure 2-1 we see a subject responding to *the demand for sufficiently integrated knowledge*. She has probably never had to talk, much less write, about her subject before, so her writing process is strongly constrained by the need to formulate just what it is she thinks or knows. We will see her retrieving information from memory, drawing inferences, and relating her various ideas. (P. 60)

While it cannot be argued that writing is often (perhaps too often) motivated by extrinsic constraints such as those mentioned in Wendy's transcript, the larger point is that the use of such discourse as an element in support of a cognitive theory of writing ignores the brunt of what has come most centrally present before this writer's predicament. Far from a "demand for sufficiently integrated knowledge," writer Wendy is very clearly acknowledging the power dilemma that constrains her aesthetic and expressive possibilities, limiting her to the production not of a text, but of a *certain kind* of text that will satisfy the waiting demands of her academic superiors. This, then, is not a data retrieval or a memory problem, although stating it in those terms permits its entry and integration into Hayes & Flower's model. They discuss Wendy's grade dilemma for four pages (60-64), even diagramming it as a node P (for *pressure*) that connects with nodes M (*motivation*), G (*grades*), PS (*personal satisfaction*), and Q (*quality*). Beyond discounting the phenomenological impact of this pressure to Wendy *as a writer* (rather than merely to the text as a process), a secondary net effect of this conceptual formalism is that it indiscriminately equates

grades, *satisfaction*, *quality* and *motivation* with *pressure* as entities different in kind but not in degree or intensity. Can this not be called a conceptual fallacy? For what they call *pressure* is the set of conditioning constraints that operate before the writer engages in the act of writing. To the extent that it precedes the authorial operation, this "pressure" modifying tone, direction, and reflective subtleties in the writing, influencing associations that Wendy may consider relevant. The evaluation process has transformed the writer - she shifts primary attention from the causal nature of the expression to the acceptability criteria of the final product. By stressing cognitive rather than phenomenological factors, Hayes & Flower's model has translated the writer's social predicament into a data retrieval problem.

The analogy to computer-based thinking is prevalent throughout this influential study in the form of flowcharts that outline the order of these sequential steps and imperatives. For instance, the following is Hayes & Flower's depiction of "the structure of the GENERATING process" (p. 20):

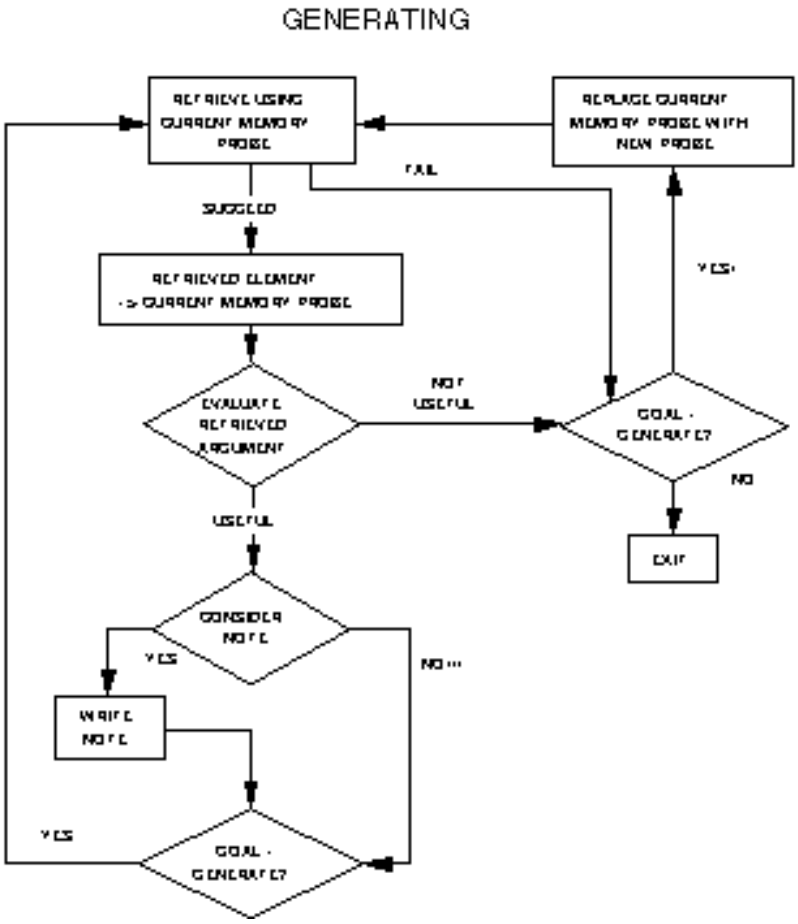

Figure 2. Structure of the GENERATING process.

Note. From Flower, L. S. & Hayes, J. R. (1979) A process model of composition. Technical Report No. 1, Document Design Project. Pittsburgh, PA: Carnegie Mellon University.

As becomes clear from their flowchart approach (one which has since become de rigueur in writing models), Hayes and Flower are attempting to effect a breakdown of the overall writing process into a set of rules that determine authorial concerns in a specific chronological order. Between flowcharts and rule production systems mentioned above, any differences between writing as an internal process and writing *production* as a cognitive formula are reduced down to a choice of the correct algorithm. Admittedly, the significant distinction between creative and expository writing should call for different methods of composition, but since their approach claims to represent all of writing - they call it a "model of the writing process derived through protocol analysis" and maintain that it "identifies not only subprocesses of the composing process, but also the organization of those subprocesses" (p.15)- this problematic direction to writing instruction cannot be divorced from cognitive structuralism as a whole.

In that Hayes and Flower's neglect of Wendy's engagement and personal challenges to reflective writing can not be called subtle, the example provides evidence necessary to make the case of why cognitive process theories of writing are anathema to the reflective approach. The stance necessary for a cognitive representation requires that one overlook critical aspects of the writer's unique world that must (and invariably do) enter the text. This stance favors adaptive mechanisms for the satisfaction of extrinsically established production goals. But antagonism to a heuristics of performance is inherent to hermeneutic critiques of systems that attempt methodical formalization of human affairs, needs, or behavior. This antagonism is supported by hermeneutic critiques of systems that attempt methodical formalization of human affairs. Gadamer, for instance, opposes not the idea of systematicity (for consistency is evident in all manner of phenomena) but rather how the idea of a scientific method alienates personal engagement in phenomenal observation, and then obscures understanding by denying (and thus obscuring) what he terms *preunderstandings* (biases) of the science, the method, and the observer:

all the modern sciences possess a deeply rooted alienation that they impose on the natural consciousness and of which we need to be aware. This alienation has already reached reflective awareness in the beginning stages of modern science in the concept of *method*. Hermeneutical reflection does not desire to change or eliminate this situation; it can, in fact, indirectly serve the methodological endeavor of science by making transparently clear the guiding preunderstandings in the sciences and thereby open new dimensions of questioning. (Gadamer, 1967, p. 39)

As we know from the foregoing problematic (but nonetheless famous) cognitive study, problems with the scientization of social relations in the human sciences make this alienation - the *opposite* of reflection - particularly acute vis-à-vis the object of analysis. This incongruous opposition is the base motivation for a critique of (and distinction from) a scientifically formalized perspective toward *all* social sciences, and, by subsumption, a cognitive approach to writing. This is because the scientific observer, by feigning detachment (or conversely, greater allegiance to the model than what has been observed) is the cause of an artificial alienation that, in Sartrean terms, amounts to bad faith:

But the modern social sciences stand in a particularly strained relationship to their object, the social reality, and this relationship especially requires hermeneutical reflection. For the methodological alienation to which the social sciences owe their progress is related here to the human-societal

world as a whole. These sciences increasingly see themselves as marked out for the purpose of scientific ordering and control of society. They have to do with "scientific" and "methodical" planning, direction, organization, development - in short, with an infinity of functions that, so to speak, determine from outside the whole of life of each individual and each group. Yet this social engineer, this scientist who undertakes to look after the functioning of the machine of society, appears himself to be methodically alienated and split off from the society to which, at the same time, he belongs." (Gadamer, 1967, p. 40)

After this cursory look at some inconsistencies of cognitivist or formal models of writing and our ensuing look at the recent history of writing instruction, it will become apparent that the convergence of hermeneutic phenomena of the textual act with its pedagogical understanding is lacking and necessary and that the phenomenon of writing and its pedagogical understanding have been at some distance one from the other. Hermeneutics poses a cardinal point of representation and interpretation of the writer's personal acts in the world; pedagogy poses a cardinal point of reflective exploration in the most consistent manner possible. Difficulties in bringing these worlds together are understandable, for writing is the fulcrum around which both points revolve; writing in the final analysis wants to be a deeply personal expression but yet cannot avoid being mediated through an abstract symbolic form. Subsuming the writer's natural and intuitive propensities within a theoretical model of typological entities, as do models of writing (on which the pedagogies have themselves been based) would seem only to further complicate matters. The present work therefore does not intend to set out another formal model of mental processes involved in written composition. I am not convinced that we can entirely define a formal model of writing. When we consider reflectivity as a condition for expression, the need to avoid formalism is all the more critical - formalistic schemes are *directed through* the processing of information toward some explicit result. This stands in polar opposition to the act of reflection, which cannot be vectorized toward a priori intentions, as Husserl affirms:

Reflection, therefore, is not a perceiving in which we can simply be turned toward what is perceived; reflection occurs only on the basis of and in divergence from direct orientation. (Husserl, 1973 [1948], p. 55)

Working with reflection means embracing a progressive divergence from linearity implied in many formal models. This is what necessitated the foregoing critique of the cognitive paradigm so endemic to modern writing pedagogy; one must be careful not to over-categorize or over-constrain. At the same time, I cannot leave matters there. It is important to free up theory from its asphyxiating tendency over the serendipitous nature of creative impulse, but having done so, we must acknowledge that a mere critique with no proposal for improvement would make for a uselessly vacuous text, a truncated analysis that reduces what is observed down to separate elements, but which does not merge them back into some new whole. This explains why I examine how reflective writing can be realized, not in an abstract model, but in the actual world of the computer. The bridge to both is the ability to follow the development of a text over time and themes - a possibly applied hermeneutics of writing.

Closing as we opened, with Gadamer, permits us to consider the desirable convergence of reflection with technology through a definition of hermeneutics that differentiates its character

from that of the formalistic. In the previously quoted essay "On the scope and function of hermeneutical reflection" (1967), Gadamer clarifies this distinction:

the thing which hermeneutics teaches us is to see through the dogmatism of asserting an opposition and separation between the ongoing, natural "tradition" and the reflective appropriation of it. For behind this assertion stands a dogmatic objectivism that distorts the very concept of hermeneutical reflection itself. In this objectivism the understander is seen - even in the so-called sciences of understanding like history - not in relationship to the hermeneutical situation and the constant operativeness of history in its own consciousness, but in such a way as to imply that his understanding does not enter into the event. (p. 28)

What we need, then, is a way to bring the writer away from the remoteness of objectivism and make his expression of a kind whose understanding does in fact "enter into the event." As mentioned earlier, this may signal a new direction, both as a novel pedagogy of writing, as well as a promising approach to pedagogical design of educational writing software, wholly different from what has come before.

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3. Pedagogy - How Has Writing Been Taught?

Where it is argued that historically evolving paradigms have become pedagogies of writing.

Although models of writing instruction have been formulaic - removing by means of stylistic genre criteria the process of production from the actual conditions in which the writer works and lives - writing itself is not a hermetic activity. Independently of how organized (a report, a letter, a book, a poem, etc.), a text never focuses *only* on a closed or narrow question. Its language and logic are full of dependencies, references to all manner of outside knowledge. To the degree that understanding anything written presupposes such knowledge, writing is always an epistemological activity, and one must therefore take into account not Knowledge, but *genres of knowledge* as one accepts not Writing, but genres of writing. Because the value of writing is often attributed solely to its clarity, the expository writer is also typically seen as a mechanic whose product must be tooled into descriptive perfection. This is the basis of the tacitly epistemic separation of writer from text. But as this separation of writer from written is untenable in reflective writing, a problem stems from the divide between objective and subjective knowledge. And since this popular belief runs counter to our denial of object and subject in the reflective mode, we must fight an objectivist, scientific paradigm that lends greater credence to non-reflective, decontextualized writing. Let us analyze that concept and its connection to history as regards writing instruction.

Analytically, the paradigm is an epistemological, historical, and a hermeneutic device. This assertion is popularly attributed to Kuhn (1962), although it appears much earlier in the work of Popper (Neurath, 1935) and even as early as 1910, in the work of Cassirer ([1910] 1980, p. 243). If we believe that different paradigms - organized consensus systems - determine the validity of knowledge at different historical moments, then the importance of grand narratives - theories that endure through time and claim to be descriptively true independent of cultural context (e.g., scientism, Freudianism, Marxism, capitalism, rationalism, etc.)- is open to question. This is not to disavow all paradigms or to deny the presence of universals. What is refuted is the presupposition that any paradigm as a pervasive knowledge model must, because of its prevalence at a given epoch, perforce be founded on deep lodes of truth rather than socially shared beliefs. Since Kuhn demonstrates that scientific fields operate on the basis of certain value systems preserved not by absolute methods, but by the power of consensus, these "concrete problem solutions that the profession has come to accept" (Kuhn, 1959) serve not just as solutions, but as guides to further research - they become traditions upon which future work is based. It is clear that, in the magnification of their role from social consensus to social inspiration, paradigms propagate a normative world view. As will be shown in Section 3.1, recent similarly paradigmatic fashions in

the American education, taking their cue from scientism, have held the teaching of reflective writing in disturbing abeyance.

There are two historical features of the paradigm concept that might justify the long-standing neglect of hermeneutic or reflective writing within writing pedagogy. First, the dissection of an assumed cumulative, singular, historically growing Knowledge down into moments that have as much autonomy from each other as they do layered interconnection is implied by the historical fact that competing paradigms with different patterns and assumptions of methodology become prevalent in different epochs. In each epoch, knowledge is created largely by assumptions (with different degrees of verifiability), where the opposite is what is normally assumed. Across epochs, the effect grows; since each methodology is different across history, it takes on the practices and language of an era - and therefore its biases. This epistemic succession entails a revolutionary (and contradictory) displacement: new discoveries make knowledge not just cumulative, but structurally *transformed*, with the mass invalidation of entire epistemic branches that were once considered true. Retrospectively, the intuitive power of this assertion is obvious, but this necessitates a serious critique of the primary criterion of science: objectivity. For, the idea of progress as *tentative nullification* inevitably calls into question the idea that phenomena exist independently of the observer. That is, if the essential structures of ultimate knowledge which generate theory undergo complete replacement from time to time, how can one prove that all socially accepted, scientific knowledge isn't constructed rather than discovered (as is claimed)? Verifiability offers us no definitive defense: what has been verified in one generation has frequently been nullified in another.

Despite this flaw, and because objectivity is the founding pinion of scientific inquiry, it is not surprising that representatives of science have countered forcefully that the study of natural phenomena is *purely* objective, since the apple falls from the tree regardless of the position or attitude of the observer. But this is to conflate observation with explanation. The Kuhnian theory of paradigms doesn't critique observation (the starting point of objectivist science) but rather explanation (its end product) in terms similar to the Kantian distinction between phenomena and nuomena. As for reflective writing, this means that its long-standing omission from the history of writing instruction may be less a critique of its worth than a comment on its complete independence from social imperatives of different historical moments. As for the paradigm concept, it is seldom noted that, since the task of the paradigm is to effect historically accurate reconstructions, re-readings, of antiquated conceptual systems, Kuhn unwittingly defined the paradigm in hermeneutic terms. Kuhn himself made this observation more than once (e.g., Kuhn, 1977, p. 8-12; Kuhn, 1987).

There is little reason here to rehearse the epistemological debate over paradigms of scientific reasoning. But this debate has led to the belief that one kind of writing is more valid than others. To scientific method, knowledge is fully available to linguistic description, and, conversely, language is transparently able to reflect knowledge (epitomized by the expository style, a dominant type in the pedagogy of writing). It is the power of the scientific paradigm that has made this proclivity possible, as borne out by the recent history of writing instruction in the United States - the focus of my next section.

3.1. Writing Instruction and its American 20th Century History

In 1892, the National Education Association appointed a group known as the Committee of Ten, headed by Harvard president Charles Eliot, to examine the curriculum of secondary schools. This committee in turn appointed the Conference on English, which became charged with defining the purpose and direction of English studies at the high school level. It defined the objective of these studies as "(1) to enable the pupil the expressed thoughts of others and to give expression to thoughts of his own; and (2) to cultivate a taste for reading, to give the pupil some acquaintance with good literature, and to furnish him with the means of extending that acquaintance." (Burrows, 1977). James Berlin (1990), in his excellent and thorough account of the curricular practices around this time, concludes three effects from this set of objectives:

1. This neutrally stated set of aims began to reveal a bias toward the impersonal description of objectively verifiable phenomena, since training in 'expression of thought' meant applying the tenets of faculty psychology to capture the state of the external world with maximal precision.

2. This recommended method, characterized as current-traditional rhetoric, became the method pursued in Harvard's English department - not surprisingly, since the conference was appointed by the Harvard president and conference secretary was a faculty member at its English department.

3. This strand of writing practice came to embody something more orthodox than faculty psychology. As Berlin clarifies, "Its epistemological base is positivistic and rational, offering writing as an extension of the scientific method. Since the basis of all reliable knowledge is sense impression, the writer is to use inductively-derived data whenever possible" (p. 188).

It should be noted that Harvard still maintains this tradition, requiring all undergraduates to enroll in the mandatory expository (not creative) writing course during freshman year.

From the abstract discussion of epistemological paradigms, we come to behold a specific case where normative objectives are set out that explicitly defend one kind of writing as superior at the highest educational level to all others. But writing instruction evolved in ensuing decades to encounter and follow other objectives, usually those of immediate social importance at the time.

During WWI, for instance, the American study of composition was, like every other human endeavor, marshaled to the defense and preservation of domestic imperatives, which in writing translate to the observance of patriotic themes and national values (cf. Ohmann, 1987). This was a relatively short period, since the U.S. entered the Great War for only one year, but it paved the way for a structured approach to teaching and evaluating writing. The following decades were subsequently dedicated to the improvement not of teaching but of measuring what was ostensibly learned. The conscription of ideology in support of the war effort was thus followed by the construction of norms to measure whether the learning of writing was progressing as a "properly learned" skill or not. The general view is that after the war, G. Stanley Hall and E. L. Thorndike were key influences in bringing writing instruction under the microscope and values of a highly structured and positivistic psychology (e.g., Kantor, 1975). While Hall argued for expressive writing in general terms (rather than in presence of the broader ideas I outlined above), Thorndike

proclaimed himself value-free on the issue of pedagogical purposes, so long as they led to measurable results (Kantor, 1975). Even though expressive writing was encouraged, the colossal assumptions on both camps, of course, were that good writing could somehow "happen" as much in the absence of philosophically profound self-reflection as in the presence of constant evaluations. The only astounding part of this is the question of how such a wild disparity, which could lead to nothing short of either expressive vacuousness or expressive rigidity, was not brought to question rather than the full acceptance it eventually came to enjoy. From this acceptance cascaded numerous questionable traditions on micromanagement of the writing process, seeing the process as the causal form behind the content, and tracking students on the basis of narrowly (and somewhat shallowly) defined quantitative criteria.

At the same time, an iconoclastic reaction to this formalism gave rise independently to the expressive movement in writing instruction, led primarily by Harold Rugg (1928), John T. Frederick (1934), and Hugh Mearns (1940). In this vision, writing was to be seen and treated as an art subject, emphasizing the creative at the expense of the mechanical. One hope of this trend was that encouraging such writing would also make for a better reader. This trend was challenged (with unfortunate success, by most accounts) by the E. L. Thorndike brand of measurement reductionism, which not only reduced writing to assessable norms, but placed the results of students' writing productions within larger hierarchies, like tracking. This was accomplished by comparing such work to nationally scored norms (Kliebard, 1986).

This behaviorism was tempered somewhat by the appearance during the 1940's of the communications course, which brought together linguistics, speech, and English departments in the service of a broad synthetic analysis and application of writing, speaking, reading, and listening. As in other epochs, however, the methodology was highly influenced by the thematics of the pedagogy, as the content of focus was generally the conservative analysis and defense of American democratic ideals, especially after the launch of Sputnik and the early dawn of the Cold War (Berlin, 1987).

Two other strands that informed writing instruction were that of transformational linguistics and that of cognitive psychology (Berlin, 1987). The linguistics "school" anatomized writing by breaking down the text for combinatorial and stylistic experiments; text was roughly conceived like a grammar of replaceable components. The primary unit of analysis here was the sentence, and good writing was seen as the outcome of such properly created and intertwined utterances (e.g., Bateman & Zidonis, 1964; Hunt, 1964). Much later, this evolved into a larger view, and many of this school's structuralist proponents began the process writing movement some decades later (e.g., Faigley & Witte, 1983; Faigley, 1985; Faigley, 1992)

Overlapping with this (and later becoming much more influential) was the view of writing instruction based on cognitive psychology, particularly the more liberal brand proposed by the Wood Hole Conference headed by Jerome Bruner (Bruner, 1961). The approach taken here revolved around the conception of education as a process that should occur within established scholarly disciplines and best follow a balance between the structure and increasing complexity laid out by its domain experts on one hand, and the gradually developing cognitive abilities of the student (in the Piagetian sense) on the other. This influential approach made it possible to

synthesize pre-established scientific method with emerging constructive intuitions of the student, who combined both in a sort of self-directed research practice appropriate to his or her curiosities and abilities. This resonated naturally with the more individual disciplines like writing instruction, because it enabled teachers to encourage composition as a discovery activity in an enabling environment generally unfettered by ideologies of content. Bruner's recommendations were supported both by research (e.g., Emig, 1971; Britton, 1975), by other proposals that explored the work in greater detail (e.g., Moffett, 1968), and, when combined with rhetoric, by pedagogies adapted to the college curriculum (e.g., Lauer, 1968; D'Angelo, 1975; Tate, 1981) . While the cognitive objectives appeared to be significantly more flexible than all previous pedagogies of writing, they had two important setbacks. First, the flexibility of the approach precluded taking the student's writing in any specific direction with any depth, and so, the lack of a normative basis for this pedagogy did little to foster an understanding of deeper problems associated with the writer's observations, identity, and world in the context of written expression. Second, the aim of intellectual development which guided the cognitive approach was always prone to being redirected on the basis of one or another definition of just what intellectual development was taken to mean. Rarely was this understood in terms of introspection.

The weaknesses of the cognitive approach to writing instruction became apparent after a number of British and American teachers converged in the Dartmouth Conference of 1966 to compare broad pedagogies and problems (Applebee, 1974). The British (more freely expressive) model of writing had been around for some years, but had, for the same political and paradigmatic reasons that stimulated the previous models, not been central to American education. Yet now it found a new voice in the work of many theorists, including Ken Macrorie (Macrorie , 1976), Albert Wlecke, Donald Murray (Murray, 1978), Walker Gibson, William Coles, Jr., (Kantor, 1975, p.24), and Peter Elbow (Elbow, 1981, 1983, 1986). Thus a polarity was set up between the cognitivists, whose detached, neutralistic approach during the Viet Nam war was favored by conservative teachers, and that of the expressionists, whose pedagogies were naturally suited for questioning the status quo as much as the self (cf. Kinneavy, 1971; Gebhardt, 1979; Berlin, 1990, p. 211). As the latter were primarily philosophers rather than psychologists, their work was from the beginning (and has since increasingly become) concerned with the problems of writing as rhetorical construction and social critique, rather than grammatical correctness and linguistic development (cf. Martin & Ohmann, 1965; Lawson, Ryan, & Winterowd, 1989; Winterowd, 1989; Jankowsky, 1996).

The decade of the 1960's - which was an encouraging time for writing instruction in America, since there was much to write about, and at least two predominant ways to teach it - was not followed by an equally productive era (Berlin, 1990). If the new conservatism of Nixon and Reagan influenced the possibilities of writing instruction from about 1970 to 1990; the administrations of Carter and Bush probably did little to bring about alterations in direction, style, or intensity. Certainly, the conservative trend was most identifiable in alarmist attitudes toward education being as in a dismal state, a diagnosis reached by review of nationwide test scores in primary and secondary schools (e.g., Forgione, 1998). Resulting programs, which were intended as broad-brush, across-the-board improvements of scores, were monitored according to strict and narrow testing parameters, and the era of standardized tests began to mushroom. As could be expected, this radical decline did not go unnoticed. From the earliest days of this new direction, it

was reported that writing instruction in all but the most advanced placement courses had all but vaporized across the country (Squire, 1968; Faigley & Miller, 1982).

An overview of different composition models will aid comparisons:

Table 2. Overview of Composition Paradigms

Composition Model	Key Proponents	Unit of Analysis or Methodological Focus	Learning Outcome Priority
Positivistic Psychology	Hall (1894) Thorndike (1907)	instruments of measurement & evaluation of writing	rules and rankings
Aesthetics of Composition	Frederick (1934) Mearns (1940) Rugg (1928)	writing as a work of art; holistic view	creativity of perspective
Structuralism	Bateman & Zidonis (1964) Faigley (1985, 1992) Faigley &Witte (1983) Hunt (1964)	sentence combining; anatomy of writing as rule system with interacting elements	sequences
Social Rhetoric	Martin & Ohmann (1965) Jankowsky (1996) Lawson, Ryan, & Winterowd (1989) Winterowd (1989)	process; writing as individual expression combined with social consciousness & responsibility	unification of self with social awareness
Cognitive	Bereiter & Scardamalia Britton (1975) Bruner (1961) D'Angelo (1975) Emig (1971) Hayes & Flower Lauer (1968) Lunsford Moffett (1968) Tate (1981)	writing as problem-solving	ideas as intellectual & mechanistic productions
Expressivist	Coles (1974a, 1974b, 1978) Elbow (1981, 1983, 1986) Gebhardt (1979) Gibson (1962, 1966, 1969) Kinneavy (1971) Macrorie (1976) Murray (1978) Rohman & Wlecke (1964)	writing as broad-based exploration	intuition; contexts

Summary

Overall, it has become clear that rarely in American history has writing been taught, encouraged, or used to foster hermeneutically reflective thinking, even though critical thinking has found a niche in the school of social rhetoric that gained popularity in the 1960's. The emphasis of most pedagogies of composition has demonstrably followed and supported utilitarian or socially adaptive imperatives, so that, instead of favoring self-discovery, writing as an educational activity has more typically been used for constructing accommodations of self within the boundaries of established cultural, social, and economic values. The only exceptions to this proclivity were the approach of the social rhetoricists in the 1960's and 1970's, and, some years before it, in the Aestheticists' use of literary texts to explore the composition process. The rise of the social rhetoricians (which included Marxists and other progressive reformers) was partly inspired by three important weaknesses of the aesthetic approach (the intervening - and primarily European - Structuralist school was embraced only in selected curricula and campuses in the U.S. and thus has not been influential to subsequent schools of writing instruction). First, the decision to use literature as the stimulus to the production of student texts assumed that students had little to say in the first place and thus needed a source of content ideas (Ohmann, 1976). Second, the use of literature presupposed the acceptance of a literary canon which may or may not be in harmonious resonance with the problems and interests of students - the authors themselves. Thirdly, while, as Plato said, art begins with imitation, the danger is that students will merely learn to copy expressive forms and entirely circumvent the painful and rewarding processes of reflective self-exploration in a maelstrom of dilemmas that life continuously brings forth. In place of this, students were instead to use literature to become witty and clever rather than profoundly self-aware writers.

Today, writing instruction in the U.S. is more variegated, separate university-specific programs follow one or more of the traditions outlined above. Some programs, like the National Writing Project (Gray, 1983), have been teacher-initiatives in response to the lack of structural support or leadership from state or federal government. But there is currently no unifying model or vision.

In education and composition, computers have followed the broader educational fashions of their day, though the history has been much shorter. Since their arrival in the college-level writing classroom in the late 1980's, computers have undergone three such stages in their pedagogical genealogy. The first was the current-traditional paradigm (Berlin, 1987), where they were utilized as corrective or remedial tools. Typically, this involved programs for improving sentence structure, stylistic consistency, and clarity of description. In the early 1990's the prominent place of special-purpose drill and exercise software was replaced by that of the word processor. This gave rise to larger-level composition problems - sequence, structure, and revision (Takayoshi, 1996). This application has in turn been overtaken by local area networks and the World Wide Web, giving rise to the implementation of distributed-collaborative activities and models of composition and pedagogy (Mabrito, 1991) that had been envisioned only a few years before (Sirc, 1989). Still, these three phases nevertheless focus on improving word-, sentence-, and passage-level competencies. The *writer*'s world as it unfolds in the text is still a largely forlorn object.

4. Praxis -How Is Hermeneutic Software Possible?

We now move to specifics and what I am proposing: a speculative implementation in writing software. Having respectively obtained a sense of the hermeneutic aim of interpretation, something of the history of writing instruction, and a taste for the type of cognitively oriented research that has informed it, we are justified in reaching some preliminary conclusions. The first part of this work argued how writing is a profoundly mysterious and exploratorily open-ended activity - not merely a problem-solving or otherwise bounded approach to description. From the second part of the work, we can deduce that the broader or more exploratory and reflective aspects of writing have not been acknowledged or taught in any systematic way - as have other aspects that more closely mirror the social dictates of the prevalent *weltanschauung* in each era. From the third part of the work, we can deduce that attempts to study the process of writing have been methodologically limited to the cognitive, performance or locally conceptual aspects of writing - to the expense of phenomenological or hermeneutic aspects, including *what makes* a writer a reflective writer, and what happens in the reflective stance.

It seems strange to speak critically of the cognitive-scientific paradigm when (a) it has been so demonstrably present in writing instruction, and when (b) it has found a conspicuous place in computer science implementations, particularly in artificial intelligence (AI). But many such projects that began ambitiously have encountered difficulties and did not produce the intended results - a fact predicted by some (e.g., Dreyfus, 1972) and taken to new directions by others (e.g., Winograd & Flores, 1986). Throughout, persistent shortcomings were primarily related to machines' inability to learn robustly and to understand natural language (Winograd, 1980). The height of the cognitive science/AI synthesis came in the 1980's with the promise of software architectures that could model important aspects of human thinking. This included systems in natural language comprehension, neural network and distributed parallel programming systems, and expert systems (see Shapiro, 1987 for a thorough treatment of this history). As with the case of computer holography a decade earlier, the promise of these systems did not, except for a few notable exceptions, reach fruition. What went wrong?

Though generally unexpected, this disappointment was predicted by computer scientists whose expertise was supplemented not by cognitive science, but by philosophical hermeneutics. Early on, for instance, Dreyfus (1972) had used Heidegger's hermeneutics to differentiate the manifold realities of Dasein or experience-embedded thinking and being from its formalistic schematization - a very poststructuralist argument for a computer scientist. From this critique it follows that representations (including computer-based systems) built on such formal representations, including all forms of artificial intelligence, will not be true to the form of activity they intend to represent. With notable clairvoyance, this view implicitly cast doubts on the possibilities of using artificial intelligence for all but highly specific tasks - a limitation that has since the 1980's been proven all too true. With less pessimism, Winograd (1980) and Winograd and Flores (1986) also explored thinking in a Heideggerian context and posited a new direction for software design that would be informed by the type of flexible, non-categorical thinking that characterizes the natural

situation of humans. They also advised potential designers that as a condition for embarking on such work, they must be prepared to accept the requirement of *not* building around a specific problem or class of problems. That is, hermeneutically informed software should not be construed as a problem-solution intervention, but instead as an activity that enters and leaves the user's thinking at any point s/he decides. Minsky (1982) has also argued this. Here, hermeneutics differs from the cognitive paradigm by its denial of a closely circumscribed setting for interpretation and context for engagement. At its core, cognitivism is a functionalist approach, whereas hermeneutics is not. The resistance of human activity to a formalized representation schematology proved the downfall of computer-based architectures whose foundations were framed exclusively in formal cognitive models. Is there a non-reductionistic way to apply hermeneutics for an expressive activity like writing?

4.1. Applied Hermeneutics: Roland Barthes and S/Z

A consummate case study from literary theory is Roland Barthes's S/Z (Barthes, 1970), an analysis of *Sarrasine*, a short 32-page novel by Balzac. This is one of those rare cases when the critique of a minor work becomes a major work in itself. S/Z, which runs 217 pages, also outsizes the original work by a factor of almost seven. What is the rationale for such a protracted analysis?

Barthes makes his motivations initially clear: he is disturbed by the objectivist distance that accrues between the reader and the writer (we have already noted that this objectivity is precisely the aim of traditionally oriented writing instruction). Particularly, the predicament of the reader is his inability to make the text function, move, come alive in anything like an interactive way. In fact, Barthes denies that the work exists to foster passivity of any kind, and distinguishes texts intended to be read as complete, self-contained repositories of knowledge (which he calls *readerly* [*lisible*] texts) and texts that are at critical points somehow incomplete, and in which the reader must perforce draw from within to meet, or help write them (texts which he calls *writerly* [*scriptible*]). Between these two, Barthes considers the latter infinitely more important. His explication of this brings into one statement both a defense and a critique:

Why is the writerly our value? Because the goal of literary work (of literature as work) is to make the reader no longer a consumer, but a producer of the text. Our literature is characterized by the pitiless divorce which the literary institution maintains between the producer of the text and its user, between its owner and its customer, between its author and its reader. This reader is thereby plunged into a kind of idleness - he is intransitive; he is, in short, *serious*: instead of functioning himself, instead of gaining access to the magic of the signifier, to the pleasure of writing, he is left with no more than the poor freedom either to accept or reject the text: reading is nothing more than a referendum. (p. 4).

Forging of the reader this type of production is precisely the goal of Barthes' analysis of texts, in opposition to the cognitivist program of models that use data as incorporated evidence to defend the scheme. As illustrated in an earlier example, this often calls for suppression of the obvious in defense of the obscure.

We are not venturing into literary theory without cause for action. There are at least two pragmatic implications in this use of literary analysis. First, interpretation of field phenomena - interactions, conversations, descriptions, and intentions - can be approached as an unbroken passage of mutually responsive expressions (which is the anatomical purpose of texts like books, transcripts, epics, and conversations in the first place). This is as much the case in social science as in literature; any division on ideological or methodological lines is a matter for the exclusive interest of scholars in the separate disciplines to sort out, and is unrelated to the phenomena under observation. In a famous example of the projective power inherent in the reality-as-text argument, Geertz asserts that

[d]oing ethnography is like trying to read (in the sense of "construct a reading of") a manuscript - foreign, faded, full of ellipses, but written not in conventionalized graphs of sound but in transient examples of shaped behavior. (Geertz, 1970, p. 10)

As for the narrower case of Barthes' terminology, any thought on the writerly text reveals immediately that it is an unbounded and problematic concept. In fact, it needs to be pointed out that a writerly text - in its state of being as that thing which one supplements by trying to understand it - is not a text at all, but a context of engagement, a situation contingent on the contribution of one's presence ("the writerly text is not a thing, we would have a hard time finding it in a bookstore" p.5). Its difference with a cognitive orientation is that it comes after all categorical organizations; its model is

a productive (and no longer a representative) one...The writerly text is a perpetual present, upon which no *consequent* language (which would inevitable make it past) can be superimposed; the writerly text is *ourselves writing*, before the infinite play of the world (the world as function) is traversed, intersected, stopped, plasticized by some singular system (Ideology, Genus, Criticism) which reduces the plurality of entrances, the opening of networks, the infinity of languages. (p. 5)

With the writerly text, we have effectively replaced the notion of representative system with the *activity* of representation. In Barthes' way of putting it, "We are, in fact, concerned not to manifest a structure but to produce a structuration" (p. 20). This kind of engagement must follow the full span of meaning implied in texts and acts, a fact that may be antithetical to the scientific approach of validity versus nullification: "To interpret a text is not to give it a (more or less justified, more or less free) meaning, but on the contrary to appreciate what *plural* constitutes it" (p. 5).

The plurality of meaning, twice mentioned in these passages, has been a central problem within the study of hermeneutics. Barthes follows this missive with one of the most important statements on the power and quality of interpretation - a statement to which we will return later, when we examine directions for reflective software design:

Let us first posit the image of a triumphant plural, unimpoverished by any constraint of representation (of imitation). In this ideal text, the networks are many and interact, without one of them being able to surpass the rest; this text is a galaxy of signifiers, not a structure of signifieds; it has no beginning; it is reversible; we gain access to it by several entrances, none of which can be authoritatively declared to be the main one; the codes it mobilizes extend *as far as the eye can*

reach, they are indeterminable (meaning here is never subject to a principle of determination, unless by throwing dice; the systems of meaning can never take over this absolutely plural text, but their number is never closed, based as it is on the infinity of language...all of which comes down to saying that for the plural text, there cannot be a narrative structure, a grammar, or a logic; thus, if one or another of these are sometimes permitted to come forward, it is *in proportion* (giving this expression its full quantitative value) as we are dealing with incompletely plural texts, texts whose plural is more or less parsimonious. (pp. 5-6).

This announcement declares forcefully that interpretation cannot be adequately contained in hierarchically, chronologically, structurally, grammatically, or logically organized formal models, yet does not deny that some categorical schemes can be useful to show the plurality of interpretive possibilities.

Barthes is able to organize an interpretive approach that remains true to both senses of his proclamation by exploring not denotations, but connotations in the text. This type of activity need not be considered as something to be limited to theory, or even to adult learners. Denny Taylor's landmark book From the Child's Point of View (1993) constructs a pedagogy that uses the writings of first and second graders as a source of knowledge for guiding further teaching (cf. particularly the section, "Developing Systems of Analysis That Reflect the Multiple Layers of Interpretation We Are Trying to Incorporate in the Bibliographic Profiles We Are Writing" pp. 112-115 and the subsequent discussion on "Teaching, Learning, and Schooling: What Happens When You Make a Paradigm Shift?"). As Taylor notes (p. 5), the radical nature of this approach has contributed to an open war in the New Hampshire Board of Education against teachers who want to teach without testing. The application of a multiple-interpretation approach to writing instruction appears to be as controversial in the American schooling of the 90's as it was in French literary theory of the 60's, and the antithetical polarity between the writerly approach to texts and the notion of specific grading criteria reveals at its core the ideological and epistemic polarity between the hermeneutic and the cognitive orientation to knowledge.

Taylor's approach is similar to that of Barthes in that there is only a categorization of *kinds* of reading/writing or representation, but no hierarchical model of normative or desired transitions between them. Taylor categorizes 11 different kinds of writing (autobiographical, creative, educational, environmental, financial, instrumental [e.g., taking phone messages], interactional [e.g., "I made this for you"], memory-aid, recreational [i.e., writing to amuse self], substitutional, and other) and 12 kinds of reading (confirmational, educational, environmental, financial, instrumental, news-related, recreational, scientific, technical, and other) to build up a writer's portfolio as the basis for raising questions and gathering further information (Taylor, 1993, pp. 192-203).

Barthes' loose categorizations comprise five kinds of writing contained in the text. Each kind of writing, which he terms a *code*, engages a different form or strand of reality in the act of being signified - openly or secretly. Rather than seeing events, then, Barthes organizes this work as a set of voices that speak each time a certain type of activity takes place - including acts that are historically, culturally, symbolically, hermeneutically, descriptively, and contextually grounded. Each voice or code is different from the others, and, by looking at the work in this way, Barthes

forces us to understand the text as a layered tapestry of rich connotations. The writer or reader who understands a text in this way is perforce entering a reflective mode. Textual reflectivity emerges from the coexisting plurality of connotations. Thus, as mentioned, these codes are not cast into a hierarchy or formalism so that "if we make no effort to structure each code, or the five codes among themselves, we do so deliberatively, in order to assume the multivalence of the text, its partial reversibility" (Barthes, 1970, p. 20). It is not difficult to see how this plurality, layering, and subsequent reflectivity represents the cardinal point of departure from any cognitive orientation. The five codes merit closer study as both touchstone for elements of hermeneutic analysis and catapults for design implementation within software-based interactive writing environments. Below I thus include considerations relevant to the software implementation of the codes, and a sample prototypical view of what each code could resemble at the level of the computer interface.

4.1.1.1. The hermeneutic code

The hermeneutic code designates those parts of the text that present themselves *enigmatically*, as units in clear need of further investigation, units which are given but whose need for clarification is immediately obvious because they are not self-evident or elementary aspects of what comes to the reader. The first instance of the hermeneutic code is in the title of the short story *Sarrasine*, whose referent cannot be identified as a person, place, thing, or even an adjective or verb. This enigma must be connected somewhere to the essence of the story, and it is up to the reader to discover the connections that make this reference meaningful. The hermeneutic code in a work is comprised by units of hermeneutic inquiry, called *hermeneutemes*, which units comprise not just the enigmatic signifier or object, but also the path that leads to its solution. Unlike an explicit remark or a metaphor whose senses become clear to the reader, the hermeneutic code encompasses all that stands out as a question and that must be followed to determine its answer. This includes everything missing an immediate denotation or reference, and which must be related historically or in some non-local context to be understood. The most immediate sense of the hermeneutic is that which is felt as a *suspense*, and which interrupts the flow of understanding. Barthes identified eight different types of hermeneuteme important for the text (and therefore important for the writer).

The first and most important type of hermeneuteme is that of thematization, from which we ask, what relation obtains between thematization, or themes in general, and hermeneutic codes? The connection is straightforward: the creation of *recurrent activity* (conscious, or, as we know from Freud, unconscious) signals the presence of some underlying and identifying *tendency* (two examples of thematization used by Barthes [pp. 92-93] are in fact very psychoanalytic: initially unexplainable violence and aggressivity by the protagonist, as well as fantastic qualities projected onto the character of the story's old man [who as it turns out is himself a castrato, and therefore the embodiment of a living mystery, a hermeneutic code]). When the recurrence of impulses can be noticeably grouped into profiles, then the challenge for hermeneutic understanding is to observe their consistency and similarity, and the presence of any pattern confirms that their continuity is evidence of an underlying (and thus *thematic*) question that is pending and in need of resolution.

This often comes together as a discernible *tendency toward* which unifies both elements posed in the initial question of this paragraph - that is, the *tendency* is evidence of a recurrence, of a theme; what it tends *toward* is the underlying (and thus hermeneutically exposable) impulse. Hence:

Table 2. Manifestation of the hermeneutic code

Surface observations:	in recurrence, are felt as:	leading to hermeneutic code of:
observed impulses	tendency toward ...	narrative thematization

Other hermeneutemes, as forms of representing the enigma, include the *Snare*, or false lead or deliberate deception or evasion of truth; *Equivocation*, which is a mixture of both truth and snare, especially while focusing on the enigma or central question itself; the *Partial Answer*, which only exacerbates the expectation of the truth; the *Suspended Answer*, which stops the process of disclosure at an explicit or obvious point; *Jamming*, which is the admission of the insolubility of the dilemma, and *Disclosure*, or final decipherment of the enigma (or some cardinal aspect of it) (pp. 75-76). The intention common to all of these versions of enigmatic exposition is clear: writing is as prone and amenable to points of obscurity as of clarity, and both serve to elucidate the character of a text, each by its own direction and timing. The great fallacy of writing instruction is the belief that only openly clear language is the only valid descriptive instrument. One must just as often suggest, hide, dissimulate, invoke, and diverge in order to add weight to the text. This is, for instance, the ethical position of religious, esoteric, private, and poetic texts - whole genre categories that are overlooked by traditional writing instruction.

In considering the power of these textual voices, the point of exploring Barthes' codes in this study is thus to illustrate how effectively the writer's *reflective* work can be enriched, contrary to the general belief that writing reflectively cannot be taught or approached "from the outside." When the work is made to signify at different layers that transcend what is explicit and begins to enter the symbolic representation of motivations in it, the author embarks on the challenge of writing reflectively. We are of course not interested in producing better grammar or leading to literary cleverness; instead the focus is on devices by which the writer can attain a measure of surface-transcending depth (not merely *clarity*) in written description. This also does not rely on specific topics or other linguistic interventions. Whatever reflectivity may be attainable is possible by means of careful thinking about the connotations that suggestive or insinuated aspects of writing implicitly convey, and then to work within the connotations, rather than the text alone. Barthes poses the case of the hermeneutic sentence to illustrate how codes work through the author's eye to take on language, as in the case of the protagonist's name (La Zambinella), which is a noncommittal and unclear name, chosen precisely so that the author can forestall the reader's shaping any hasty conclusions as to the character. Forestalling inferences as to the character makes it possible to reveal essential complications of this object in a progressive form that gradually reveals layers of complication (and contradiction) as to its (genetic, reconstructed, hidden, and ontological) nature. The delays actually *add* meaning and significance (pp. 84-85):

The proposition of truth is a "well-made" sentence; it contains a subject (theme of the enigma), a statement of the question (formulation of the enigma), its question mark (proposal of the enigma), various subordinate and interpolated clauses and catalyses (delays in the answer), all of which precede the ultimate predicate (disclosure). Canonically, Enigma 6 (*Who is La Zambinella?*) would be set forth as follows:

Question:	*"This is La Zambinella.* (subject, theme)	*Who is she* (formulation)	*?* (proposal)
Delays	*"I will tell you:* (promise of an answer)	*a woman,* (snare)	*a creature outside nature* (ambiguity)
	a... (suspended answer)	*relative of the Lantys,* (partial answer)	
	no one knows. (jammed answer)		
Answer:	*A castrato dressed as a woman.* (disclosure)		

Figure 3. *La phrase hermeneutique*. From Barthes, R. (1970).S/Z. Paris: Editions du Seuil, p. 91.

Design Possibilities: A collection of questions and enigmas posed by the text (problems of identity, time synchronization, context) should be kept as a list or database continually available to the writer, so that the points at which they may best be answered or resolved may be anticipated as the narrative evolves, as the thematization develops. This code (and its implementation as a software device) may preserve memory and meaning by permitting the writer to "open up" areas of inquiry that are clarified only in a conditional manner that is contingent upon the revelation of other layers or aspects of the story or exposition. This type of contingency may make the work self-reflective, since what it reveals at certain points is woven within what is and is not said at other points.

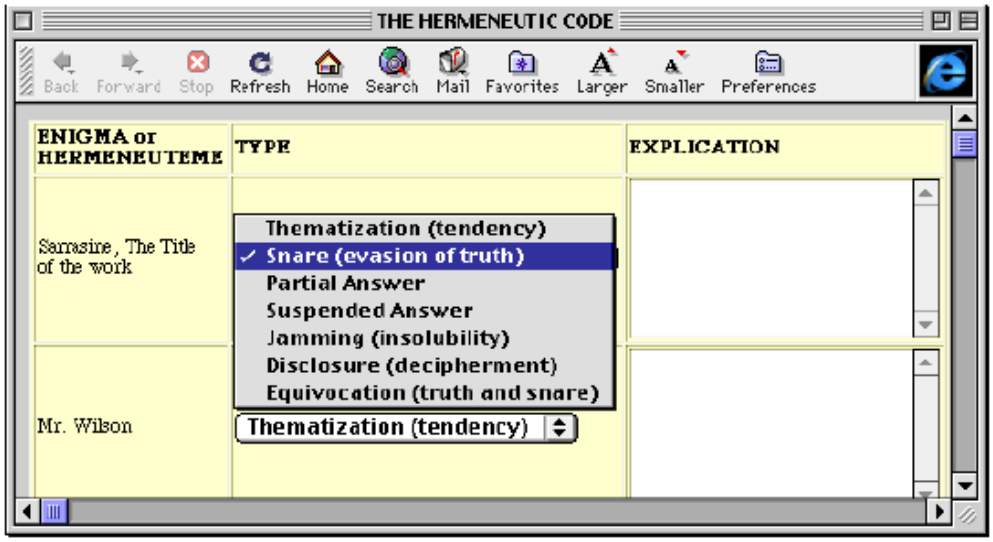


Figure 4. Hermeneutic code - one prototype view of a possible software implementation based on the compositional characteristics of the code as defined by Barthes (1970).

4.1.1.2. The proairetic code

The encounter and resolution of enigmatic moments, actions, and objects is only the first code (the hermeneutic) that Barthes identifies. Another side of this problem of successive and contingent revelation involves the fact that actions are themselves always part of more comprehensive acts. Barthes here sets out a view where *context* is a defining part of (i.e., the genealogy of) every *act*. This again stands in polar opposition to cognitive theories which, by ignoring the idiosyncratic nature of context, view acts in relative autonomy. This control permits the cognitive paradigm to be more justifiably related to some direct point on a model or scheme, rather than to an event's causal surroundings (that were themselves also intended acts). This disembodiment can be balanced by a historicizing tendency. Thus, the proairetic code involves the articulation of *sequences* as constituents of acts. In other words, this code attempts to capture the act in its process of becoming, in the *this-is-unfolding-now* sense that is tangible to the experience of an act when one is in the course of observing it unfold. Given the instinctive human tendency to compress an ongoing process, a sequence of events, into a single concept, there is a generic name one instinctively assigns to actions in a stream of experience, and the name becomes the sense that the action makes to the observer while being observed. This event stream is the name of the scenario, whose action often follows an archetypal, recognizable pattern.

Whoever reads the text amasses certain data under some generic titles for actions (*stroll, murder, rendezvous*), and this title embodies the sequence; the sequence exists when and because it can be given a name, it unfolds as this process of naming takes place, as a title is sought or confirmed; its basis is therefore more empirical than rational, and it is useless attempt to force it into a statutory order; its only logic is that of the "already-done" or "already-read" - whence the variety of sequences (some trivial, some melodramatic) and the variety of terms (numerous or few); here again, we shall not attempt to put them into any order. (p. 20)

In other words, sequence is what constitutes a recognizable act as evinced by some pattern of activity, such as *murder*, *conversation*, or *birth*. The notion of sequence is what constitutes the act. For instance, a fleetingly brief interchange of words is not a conversation; it only *becomes* a conversation when such an exchange undergoes a sequence of give and take. Barthes's understanding of what is captured in the proairetic code thus resembles the actual occasion in process philosophy. An argument could be made, for instance, equating aspects of the actual occasion with the dramatic *scene* - both are processes of continual transition of being. This unremitting development of action and the qualities it manifests are creative patterns of the proairetic code. Hence:

Table 3. Manifestation of the proairetic code

Surface observations:	in recurrence, are felt as:	leading to proairetic code of:
unfolding events	instances of...	archetypal scenario

Barthes is very inclusive on the point of proairetic codes, since a process is not delineated by strict objective boundaries. He sees certain kinds of thinking as proairetic, namely, patterns of activity that appear to be archetypal but yet are entirely culturally circumscribed, such as the pattern of *crisis*. Why? The crisis is in fact a sequential unfolding that leads to a very conscious scenario, the *impasse*. Since proairetisms are the enzymes of scenario-building, they are thus logico-temporal in nature. The most elementary proairetism is the polarity *begin/end* or *continue/stop*; it is evidence of a phenomenon of action in the writing, action which is suspended between those poles in the case of crisis (i.e., it has begun, but has not ended). The cultural-temporal connection is only the next logical step:

The crisis is a cultural model: the same model that has marked Western thinking about the organic (with Hippocrates), the poetic and the logical (Aristotelian *catharsis* and syllogism), and more recently the socio-economic. By participating in the need to set forth the *end* of every action (conclusion, interruption, closure, dénouement), the readerly declares itself to be historical" (p. 52).

Design Possibilities: The interactive writing environment should permit the author to bracket action as proairetic, so that accounts can be given a beginning and a conclusion. All narrative that is bracketed is part of the *scenario* or archetypal understanding of the event series. Such proairetisms should be nested, so that it is possible to begin and end action within other pending acts. This type of bracketing would also highlight the possibilities for definition, creation, and resolution of suspense and *crisis* in the work. This needn't be limited to dramatic or fictive writing. Suspense as the preamble to epistemic resolution is in the nature of all texts. Below is an example of a treatment of a theoretical point from Whitehead's philosophical treatise, Process and Reality:

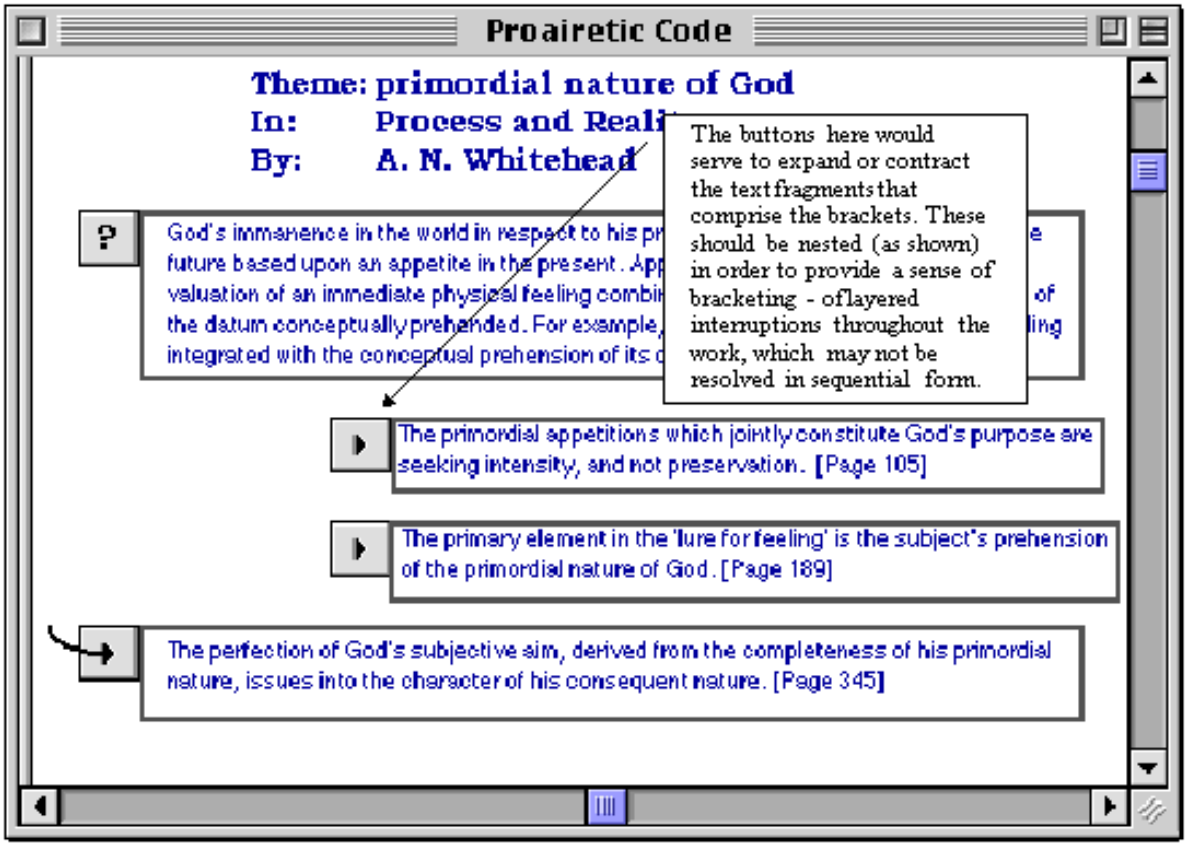


Figure 5. Proairetic code - one prototype view.

The writer should be able to quickly identify a proairetic bracketing point that is anchored by a momentary *interruption* in the flow of one description as another enters. In the case illustrated above, this is initiated by a simple "?" button which encases a small fragmentary description of the opening of meaning. It is intended (as are all of these design considerations) that these be provided by the writer during narrative design. As the text is progressively read or written, new angles that add to the sense of what is referred by this particular code can be included (here, shown by the arrow buttons). Any sense of conclusive statement on the issue or theme, can be added with a special marker (here a destination arrow). It should be possible to envision any number of such proairetisms, or expansions of bracketed action, each with its own descriptive components, and where together, all add up to a *scenario of meaning* important to the work's intention. The proairetic codes in a reflective text can thus be revealed, approached, and created by the tension between an apparent interruption of events on one hand (since current action is always encountering new action) and an expansion of activity on the other (since prior action is always supplemented by some subsequent activity). This tension is manifest in the temporal unfolding of sequence.

4.1.1.3. The semic code

The two previous codes, the hermeneutic and the proairetic, are purely abstract: the reader must infer, to re-create them as patterns embedded in the *implied understanding* of the work with much the same spirit and intention as the writer creates them. These abstract codes are like Chomskyan deep structures, they are organized thematically, they take on some cohesion as forces, but - like much deep meaning - they are not found in the explicit words of the text. This is not to deprecate the definitive, the clear-cut statements with which the work is itself created, since what is written must be investigated as much as what is not. The task for the writer, if we invert this analysis, is that she must be sensitive both to the implications as well as the explicit lexicality of a written work. Since the present study focuses on reflective rather than scientific or expository writing, I have emphasized those (implied, abstract) aspects of texts that must be given decisive attention by the reflective stance. But in the category of explicit codes that confront the author's specific words, there are additional operations of signification, centrally including the semic code.

Most narrowly, the semic code is active as the channel through which descriptions that build into traits are conveyed. In the case of reflective writing, this minimally involves the descriptions of characters and/or settings. Barthes maintains that the semic code is, like the other codes, comprised of observable elements - in this case, they are units of signification called *semes*. Semes are only aspects of text/narrative/story description, some of which can be trivial enough to escape notice - the length of eyelashes, the softness of a voice, the color of one's clothing, etc. Only when they are combined can semes form into a picture, a panorama, which becomes that which an object *connotes*. Absent other semic information, a man or a woman with long eyelashes, soft voice, and pink clothing *connotes* femininity. Semes connote, construct, and *embody* traits. Hence:

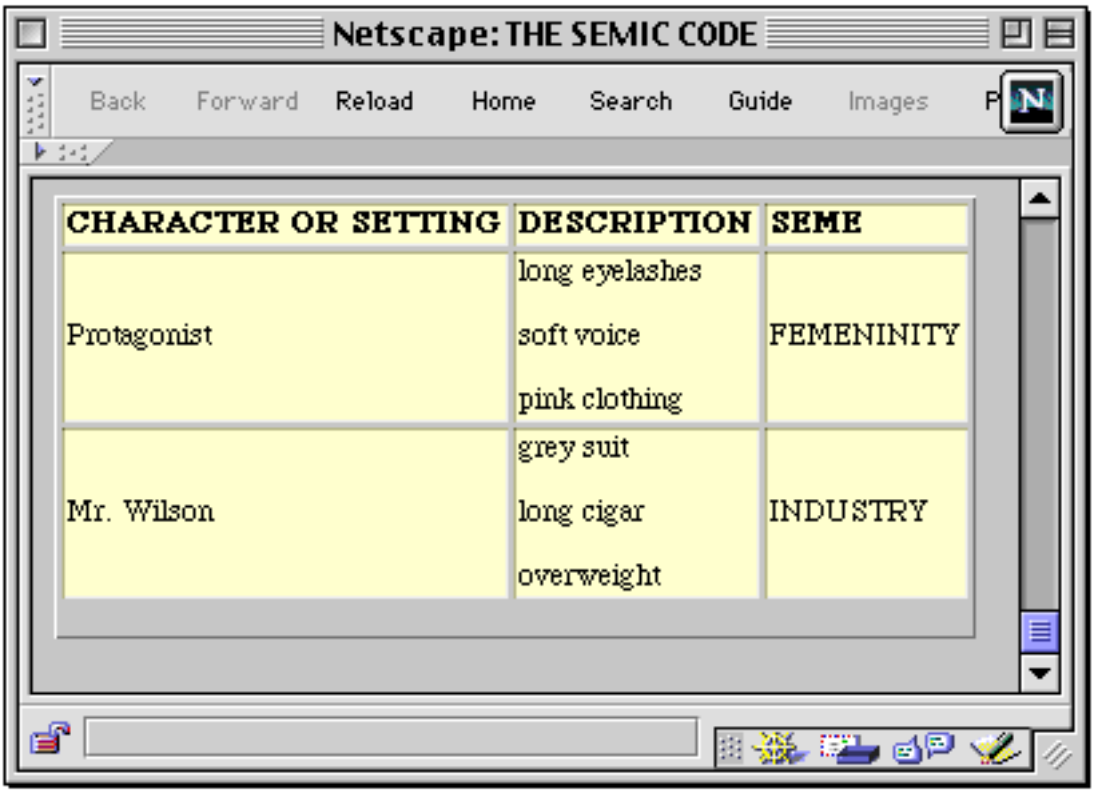
Table 4. Manifestation of the semic code

Surface observations:	in recurrence, are felt as:	leading to semic code of:
individual aspects	embodiments of...	traits, types

Design Possibilities:

The interactive writing environment should permit the writer the ability to catalogue or otherwise maintain available to memory the *semes*, of descriptive units, of a story. The author could maintain this, for instance, by noting in a separate workspace or text window those semes that appear salient, yet implicit, to a text. The traits of characters and settings are the traits of the story itself, and as such elucidate something of the deeper intention of a text. Semes are *not* merely a text's stylistic characteristics; rather, they exist in a text primarily to *connote* or to enhance the thematic message that motivates the work in the first place. Each seme in this list of textual semes of a text should

be accompanied by (and contribute to) one of a set of *traits* that characterize the deeper descriptive entities of a story. In the example above, long eyelashes, soft voice, and pink clothing are semes of femininity. These are not, however, full symbols of femininity because symbolism in the context of a story must take on a thematic dimension. Symbolism, as will be discussed next, is not what the occasional character represents, but what the entire text or story signifies. Semes build into symbols by comprising the structural components of theme.



CHARACTER OR SETTING	DESCRIPTION	SEME
Protagonist	long eyelashes soft voice pink clothing	FEMENINITY
Mr. Wilson	grey suit long cigar overweight	INDUSTRY

Figure 6. Semic code - one prototype view.

Note. The use of a browser window is not intended to imply that this design can exist only in a network mode. The above possibility is meant to illustrate that even a simple interface might contain the elements needed for the writer to represent the semic code in a given story. The primary objective here is to provide a setting in which disparate criteria of a story may be collected up, and correlated such that they may be observed to more explicitly comprise traits or types in the text.

4.1.1.4. The symbolic code

To say that something is symbolic is not merely to say that something is a *sign* of something else, that there is a *here-context* and a *there-context*, and that there exists some object suitable to both; as if to say that a pencil is suitable in the context of writing, but also as a pointing device. This is not symbolism, but mere comparison, one that implies that (a) an event or object has been perceived in some apparent totality and that (b) its form resembles that of another such object or event in a different context (e.g., a navigational one). Symbolic connotation is more than these two implications because it additionally avers that the comparison is deep and far-reaching in that the power and significance of the second context is able to *reinterpret* what happens in the first. Thus the pencil is not *symbolic* of pointing - pointing is unaffected by this reference. Yet to say that one has traveled as in an *odyssey* is in fact a symbolic statement. The connotations of a second context (e.g., a classic Ulyssean odyssey) project back to the journey (the first context) and give it a new and lasting significance. The revelation of a symbolic connection therefore transforms the original context. This is the key to religious interpretations so central to early hermeneutic theory. The flight of Israel, for instance, was not merely a historical phenomenon, but the symbolic actualization of the archetypes of straying, of loss of faith, of persecution, and of final forgiveness and redemption. The reflective writer differs from the expository writer in recognizing the symbolic plane of written accounts. Nothing is symbolic without a *theme* ("theme" is a popular synonym for the archetype function) to which it can be anchored. A collection of themes and their stories should thus be available.

The symbolic code to which Barthes refers is of this form, and is triggered by a passage or fragment - a *lexia* in the rhetorical Latin - capable, as Barthes affirms, of laying "the groundwork, in introductory form, for a vast symbolic structure, since it can lend itself to many substitutions, variations" and other forms of reconfiguration (p. 17). Hence:

Table 5. Manifestation of the symbolic code

Surface observations:	in recurrence, are felt as:	leading to symbolic code of:
objects and events	allusions to...	archetypal themes

Finally, the idea of archetypal themes in symbolic thinking underlies an important reality of symbol: that it defines the community. This is possible because the true power of symbol resides less in its ability to convey layers of meaning to an individual than in its ability to authenticate the unity of those to whom it speaks:

Obviously a symbol is something which has value not only because of its content, but because it can be "produced" - i.e., because it is a document by means of which the members of a community

recognize one another; whether it is a religious symbol or appears in a secular context - as a badge or pass or a password - in every case the meaning of the symbol depends on its physical presence and acquires a representational function only by being shown or spoken. (Gadamer, 1960, pp. 72-73)

Design Possibilities: One distinction of the reflective writer is an open intention toward the symbolic in written works. Providing corroboration of the reader's personal experience through the symbolic, is one criterion of reflective writing - in this case, it becomes a reflection of the experience of the *reader* in the text of the *writer* and amounts to the projection and affirmation of some community or collective unity (which connection will be expanded in the next code below). The writing must be able to emerge from symbolic forces, to reflect them by carrying out a reference to themes that can engage the text in a symbolic connection, and (vice versa) must be able to identify lexias from personal writings that are particularly poignant candidates of the symbolic code or voice running under the text. It is important to emphasize *under* the text, for (in hermeneutics) symbolic forces precede and manifest through text, not vice versa. The symbolic always precedes the cognitive, as Ricoeur explains:

I am convinced that we must think, not *behind* the symbols, but starting from symbols,...that they constitute the *revealing* substrate of speech which lives among men. In short, the symbol *gives rise to* thought. (Ricoeur, 1974, p. 299)

4.1.1.5. The referential or cultural code

No text is entirely self-contained. While reading and writing are full of dependencies on meanings acquired in contexts separated by time and space, there are organized bodies of knowledge on which whole texts rely. These may be cultural or otherwise organized, including artistic, philosophic, historic, medical, literary, natural, etc. "referred to, without going so far as to construct (or reconstruct) the culture they express" (p. 20). The referential code includes the historical in a writing, that which happened and has influenced (that is, entered) the present work. In this sense it is a powerful factor in the narrative, but we should distinguish it from the hermeneutic code, which is also historical in character. The simplest distinction possible between these two codes is the difference between a framework and its contents. The hermeneutic code is in play around an enigma or problem to be resolved; it follows the trail of attempts to connect it to that which will clarify it. A hermeneutic strand is thus an investigation of a definite kind, it is most centrally (but not solely) the problem or question set up for us by the nature and purpose of the writing. The referential code, on the other hand, operates only to provide background knowledge that may or may not support a hermeneutic question posed in the text. References to cultural or historical knowledge, on the other hand, can never *by themselves* suffice to fulfill the text's purpose; they are always read as that which supports a point to be inferred or explored. Hence:

Table 6. Manifestation of the referential code

Surface observations:	in recurrence, are felt as:	leading to referential code of:
allusions without full explanation	calling for the inclusion of..	prior organized knowledge

The cultural compares with the symbolic in its reference to and affirmation of collective social phenomena but differs from it in its ultimate aim for the writer, the text, and the reader. The cultural is, unlike the symbolic, not intended for the purpose of transformation, but rather as the context for an intention (which *can* include transformation). The cultural codes in a work operate to establish the position of the author and the thrust of the work, but are themselves never the final ends of the writing itself. Moreover, what is symbolic in a text is often *idiosyncratically expressed* as some set of features or suggestions that mark the writing as "special" - if special in an inscrutable way. Conversely, the cultural in a text is *generically expressed* such that it is transparent to readers who partake of the same cultural codes, assumptions, and criteria.

5. Summary

One intent of the present work has been to align an understanding of writing pedagogy, hermeneutic analysis of writing, and some dimensions of intertextual signification (as exemplified in the case study of S/Z) so as to inform design considerations for future interactive writing software. Although computer scientists have argued that writer-reflective interfaces are possible and necessary (Winograd & Flores, 1986), and although software design is very text-centric, a still-unanswered challenge for educational software is to identify something of the structure, features, and environment that will foster reflective writing.

To contribute to that line of inquiry, I turned to hermeneutics. In hermeneutics, writing is an interactive negotiation between the interpretive horizons of both reader and writer (Ricoeur, 1981). The present paper provided patterns for the design of educational writing software, as initial steps in developing guidelines to inform educational software design, and these patterns emerged from explicitly hermeneutical analysis in the work of Roland Barthes.

Barthes proposes *codes* as a device to understand the validity of multiple perspectives residing in a text, consciously or otherwise. This is necessitated by the fact that a single overview is impossible and undesirable, if one is to avoid resorting to reductionistic formalisms. True to his opposition to systematic reductionism, Barthes does not rearrange the text, nor place it in a system of semantic organizations. He merely signals the points throughout the text at which each of the codes signifies, as the text unveils itself. This maximizes an exploration of how the text's profundity unravels, while minimizing a tendency to oversimplify by means of diagrams or linear/hierarchical arrangements, as we saw with the cognitive model of Hayes and Flower.

Barthes understands that the approach is evocative, but not exhaustive. It is comprehensive, but not totalizing. The paths through, and effects of, reflective thought and written description are only a beginning for the writer - no last word is possible. And this notion, that "there is no *overview* which would enable us to grasp in a single glance the totality of effects", is for Ricoeur (1981, p.74) a hermeneutic requirement, a part of historical efficacy, and much of the basis for a critique of mechanisms of reduction, that is, *ideologies*. The importance of multiplicity in viewpoint leads to a culminating concept in modern hermeneutics: the fusion of horizons. As Ricoeur crisply explains,

This is a dialectical concept which results from the rejection of two alternatives: objectivism, whereby the objectification of the other is premised on the forgetting of oneself; and absolute knowledge, according to which universal history can be articulated within a single horizon. We exist neither in closed horizons, nor within a horizon that is unique. No horizon is closed, since it is possible to place oneself in another point of view and in another culture. (Ricoeur, 1981, p. 75)

Naturally, there are degrees of placement and displacement - one can, for instance, enter another culture only up to a point - but the fundamental point is that *some* fusion is possible, and the fullest exploration of it can take best place in an environment where multiple entry points are available, rather than a single (potentially dogmatic or ideological) perspective. This fundamentally inclusive tenet has left hermeneutics as a research practice open to the charge of being mired in hopeless

relativism. Yet this is simplistic: hermeneutic studies are not a middle path entertaining opposite or competing orientations, but rather a method for exploring different expressive layers of signification embodied in a written work, as well as the temporal layers of signification (i.e., the *traditions*) within which the work itself is involved.

The present work, therefore, has attempted to illustrate the advantage of a robust hermeneutical orientation to writing and treating texts, over against any formalistic approach such as the cognitive paradigm. As symbolic, hidden, cultural, and other layers of meaning are revealed, extracted from, and woven within a text, the broad span of reflective writing, however tenuously, can be approached. To the extent that there is a future for reflective writing, it has become more important in light of recent shifts in composition instruction away from teaching writing as a linear process of discrete components, and toward a holistic, reflective nature of composition embodied under the term 'process writing'. But this latter practice, fashioned as a reaction to formalism in writing pedagogy, is a poor methodology in comparison to the interpretive depth of hermeneutics.

What remain to be explored are implementations for the design considerations treated here. Using a classic example, I posited software as the tool that can contain memory, manage impressions, and foster deeper kinds of associative codes running through reflective texts - in ways that are sensitive to avoid typical formalisms of past approaches. I thus hope to have started building a bridge from the broad expressive problem of reflective writing to the expansive interpretation endemic to hermeneutics, which sees writing less as an assessable performance and more as a total manifestation.

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